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ABSTRACT OF THE DISCLOSURE

Uniform spatial distribution of plasma over the face of a semiconductor wafer is achieved using a multi-zone electrode forming part of an electrostatic chuck used to hold the wafer in a processing chamber. The electrode includes a plurality of concentric electrode portions to which differing RF bias voltages may be applied to produce an electric field having a desired spatial distribution. Sensors are used to monitor either the spatial distribution of the plasma or the process effects of the plasma, and the sensed information is fed back to a controller that adjusts the bias voltage on the electrode portions in a manner to maintain the spatial uniformity of the plasma.